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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,215	06/19/2001	Kyung-Ju Choi	01-4AAF DN 7985	3783
7590 05/18/2004			EXAMINER	
Polster, Lieder, Woodruff & Lucchesi Suite 160 763 South New Ballas Road St. Louis, MO 63141			FORTUNA, ANA M	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 09/884,215	<b>Applicant(s)</b> CHOI, KYUNG-JU	
	<b>Examiner</b> Ana M Fortuna	<b>Art Unit</b> 1723	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 March 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 and 48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. Claims 1-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The newly added limitation, "said highly voltage being selected upon the portion of the combined components and the size of the media strands to be formed", to claim 1 as amended, is not supported by the specification.
2. Claims 1-22, and 48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "substantially only" in claim 1 is unclear as to whether "consisting essentially of" is intended. In claim 2, the term "said cross-linking agent comprises a lesser portion range by weight of a dialdehyde..." is unclear as to whether "selecting the crosslinking agent as an aldehyde", and its particular percentages in the compound is intended. In the same claim the term "comprises a lesser portion range by weight" is redundant. Claim 3 is redundant regarding to the terms greater portion and lesser portion; the claim is also unclear regarding to whether the 0.1 %-20% correspond to the crosslinking agent or to the acid composition in the crosslinking agent. As to claim 22, the term "a greater portion by weight of approximately" is redundant or unnecessary, since the specific range of

polyvinyl alcohol is recited in the claim. IN the later claim, the term "having a three dimensional...in water" is incomplete and unclear as to whether "forming a three-dimensional structure from the cross-linked polyvinyl alcohol is intended. The process steps in which the process is performed are unclear, e.g. "in a storage zone" is unclear as to placing the polymer and crosslinking agent and water in a storage zone is intended. The term "advantageously formed".

In claim 48, the percentages of the crosslinking agent and acid are not clear; the term "of at least one of an acid or a dialdehyde, with the balance by weight being water" is confusing as to whether the percentages are crosslinking agent composition, or acid composition, or crosslinking agent selected as dialdehyde or a mixture of dialdehyde and acid.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-12, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gogins et al(6,716,274)(hereinafter '274). Reference '274 discloses electrospinning composition comprising water, water soluble polymer, e.g. PVA, and crosslinking agents for the polymer, an alternatively and additive; to form nanofibers on a substrate (column 2, lines 9-51, column 3, lines 34-54, column 4, lines 67-68, through column 5, lines 1-215, and in particular column 5, lines 9 and 21-22). Crosslinked and non-cross-linked PVA are also disclosed on '274 (column 8, third paragraph, column 32, lines 46-68, through column 33, lines 1-15, and column 34, lines 40-61), the last column teaching crosslinking PVA with polyacrylic acid. The adjustment of the voltage depending on composition is not disclosed in the reference. The composition excluding the additive or copolymer or the addition of surfactant as disclosed in the reference is not disclosed, however the claim as written does not exclude the addition of other components in small percentages, e.g. additives. It would have been also obvious to one skilled in the art at the time the invention was made to produce the fibers from the cross-linked composition, e.g. PVA (dissolved in water) and cross-linking agent, depending of the desired degree of hydrophilicity, and strength of the final microfiber property, since '274 teaches crosslinking and combination with hydrophobic materials or additives to improve nanofibers lifetime and operational properties (column 5, lines 4-24). As to claims 2-3, the percentages of polymer and crosslinking agent are disclosed in '274 (column 32, line 65, column 38, lines 54); using water as the solvent is also disclosed (column 39, lines 12-15). As to claims 4, the composition is solution, e.g. PVA, water plus crosslinking agent and optionally additive is disclosed in '274, as

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discussed above. Regarding claims 5-11 the crosslinking agents for pVA are disclosed in '274, column 9, lines 48-59). As to claim 12, the results of crosslinking e.g. formation of three dimensional structures is inherent to the crosslinking reactions of covalent bonds formation. As to claim 15, the steps involved in the electrospinning process are known in the art as recognized in '274, as technique for producing nanofibers (column 2, lines 18-43).

### ***Allowable Subject Matter***

6. Claims 13, 14, 16-22 and 48 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: The combination of process limitations of the objected claims above, for the particular polymer and polymeric mixture conditions are not disclosed or suggested in the prior art of record., and can not be predicted for the specific crosslinked polymeric composition claimed.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Reference to Doshi (thesis) discloses the technique of electrospinning to form polymeric nanofibers, including water soluble polymer fibers and apparatus involve in the process and process conditions. References 6,673,136, and 6,608,117 also teach nanofibers made form polymer positions and by the electrospinning process.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ana M Fortuna whose telephone number is (571) 272-1141. The examiner can normally be reached on 9:30-6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ana M Fortuna  
Primary Examiner  
Art Unit 1723

AF  
May 13, 2004